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# Enhancing Survey Participation among Foreign-Born Populations: Experiences from the Finnish Migrant Health and Wellbeing Study (Maamu)

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## Abstract

*The Finnish Migrant Health and Wellbeing Study (Maamu) is the first large-scale population-based health examination survey among the foreign-born population in Finland, unique also at the European level. It provides information on wellbeing of three major foreign-born groups: Russian, Somali, and Kurdish. In data collection, extra effort was put into reaching the sampled persons (n=3,000), for example by recruiting bilingual personnel to carry out the data collection, reaching participation rates as high as 70%, 51%, and 63%, respectively. A comparison group of the general population was available from a general population survey. The main challenges in fieldwork included reaching sampled persons, supervision of the fieldwork personnel, and special linguistic or cultural needs. Our experiences show that participation rate can be improved by engaging the target groups in all stages of the survey process and using several recruitment strategies, ending up with succeeding in pointing out health inequalities in the population.*

**Keywords:** migrant, health survey, wellbeing, population-based, participation, Maamu

## Introduction

### *National health surveys and health monitoring*

National health examination surveys have been carried out in Finland since the 1960s to monitor major public health problems and their risk factors (Borodulin et al. 2015; Heistaro 2008). These surveys have provided a valuable data source for epidemiological research and findings have been used for health promotion planning and implementation (e.g. Haukka et al. 2013; Vasankari et al. 2010). Major improvements in the health status of the Finnish population have been achieved through reduction of risk factor levels (Koskinen, Lundqvist and Ristiluoma 2012). However, socioeconomic differences have remained large.

Health examination surveys provide information which cannot be acquired from other data sources such as administrative registers or questionnaire surveys. Even though the Finnish healthcare system aims to allow access to health services for all citizens, registers based on health service records do not cover the total population because not all persons need or seek these services. Furthermore, health service records and registers seldom include any information on health risks and protective factors, even though such information is essential for health promotion. Health examinations provide objective data without reporting bias: this is especially important for items which often are affected by social desirability in reporting or lack of awareness by the individuals themselves. All these benefits of health examination surveys compared to other data sources are especially evident among foreign-born populations.

### *Foreign-born population in Finland and health surveys in foreign-born populations*

Migration to Finland started later than in most European countries, but has rapidly increased since the 1990s. By the end of 2012, 5.3% (285,471 persons) of the population were foreign-born (and 6.5% only four years later in 2016), with the former Soviet Union (FSU), Estonia, Sweden, Russia, Somalia, Iraq, China, and Thailand being among the largest groups (Statistics Finland 2018).

The number of foreign-born persons in random population samples of the Finnish national health examination surveys has remained too low to allow comparisons between the foreign-born and general population. In Finland, one interview survey on the living conditions of four major foreign-born groups was conducted in 2002 (Pohjanpää, Paananen and Nieminen 2003) and some articles have been published regarding the issue (Malin & Raisamo, 2011; 2012), but no large-scale health examination surveys in the foreign-born population were conducted prior to the survey described in this article.

Surveys in other European countries have shown disparities in health and wellbeing

(Kirmayer et al. 2011; Nielsen and Krasnik 2010; Toselli et al. 2014) as well as in health service utilization (Stronks, Ravelli and Reijneveld 2001) between the foreign-born and general populations. There is some support for the healthy migrant effect in a few countries, i.e. that the people who migrate are, disproportionally, the fit and healthy (Bhopal 2014). The low socioeconomic position of many foreign origin groups and difficulties in integration are found to be important contributors to inequalities in health (Dinesen et al. 2011; Moullan and Jusot 2014; Stronks et al. 2001; Toselli et al. 2014).

Several studies have highlighted various challenges in studying differences in health status and health care use between the foreign-born and general population (Rechel, Mladovsky and Deville 2012; Uiters et al. 2009). One important concern is the low participation rate among the foreign origin persons, possibly leading to serious bias in the results. The sample size in many previous migrant health surveys in Europe has been low and the surveys have been conducted only in the official languages.

## *Fieldwork protocols of the Finnish Migrant Health and Wellbeing Study (Maamu)*

This article reflects the methods used in the Finnish Migrant Health and Wellbeing Study (Maamu), the first large-scale health examination survey among the foreign-born population in Finland, to enhance participation of foreign-born individuals in a survey setting. The Maamu Study was designed to provide comprehensive information on health and wellbeing among three major foreign-born groups in Finland: Russian, Somali, and Kurdish origin working-aged adults. The number of the groups studied was limited to three due to financial and practical reasons of translating the survey measurements and coordinating the fieldwork of bilingual study personnel. The three groups were selected to represent different kinds of large foreign-born groups in Finland. Russian/FSU origin persons constituted the largest foreign-born group, Somali origin persons were the fourth largest group and the largest group with refugee background and of muslim faith, and Kurdish-speaking persons from Iraq or Iran were also among the largest groups, with Iraqi and Iranian refugees being among the largest groups of quota refugees accepted to Finland in the recent years. The study was conducted in six cities, three cities in the metropolitan area (Helsinki, Espoo, Vantaa) and three cities in other parts of the country (Turku, Tampere, Vaasa), with a higher proportion of foreign-born persons than in most of the other areas. In 2008, when the study was initially planned, 93% of Somali, 67% of Kurdish, and 47% of Russian origin persons in Finland, meeting the inclusion criteria, lived in these six cities.

A representative sample of 3,000 persons of Russian, Somali, and Kurdish origin aged 18–64 years was drawn from the National Population Registry. Selection criteria for the Russian group was to have country of birth Russia/FSU and native language Russian or Finnish. The Somali group included persons born in Somalia. The Kurdish group included persons born in Iraq or Iran and speaking Kurdish as their native language. In addition, a person selected should have had residence in Finland for at least

one year. The total random sample of 3,000 persons was stratified by ethnic group (1,000 persons for each of the three groups) and by city. The sizes of the city-specific subsamples were determined according to the size of the foreign-born population living in the particular city. The comparison group of the general Finnish population was selected from the national sample of the Health 2011 Study (Koskinen et al. 2012), including all sampled persons within the same age range and living in the same six cities as in the Maamu Study (n=2,276).

The study included two main modes of data collection: an interview and a health examination. As expected, several challenges were faced when conducting the fieldwork of the Maamu Study. These included for example reaching the sampled persons, supervision of the fieldwork personnel, and special linguistic or cultural needs in the study protocols.

### *Aims*

Several strategies were applied in the Finnish Migrant Health and Wellbeing Study (Maamu) to minimize barriers to participation and to overcome other problems in data collection of the foreign-born populations. This article aims to describe these strategies by providing a detailed description of the survey methods and its modifications during the fieldwork. The aim is to promote the development of fieldwork methods to enhance foreign-born persons' participation in health surveys.

## Results

The strategies to cope with different challenges during the fieldwork and in using the data of the Maamu survey are described below.

### *Project organization and fieldwork personnel*

The fieldwork was led by a full-time project manager, a full-time project coordinator, a part-time senior researcher and a part-time research professor, experts in conducting health surveys, located in the National Institute for Health and Welfare (THL) and working an externally funded three-year period including planning the details of the survey (less than a year in 2010), leading the fieldwork period to gather the data (more than 1.5 years in 2010–2012), and reporting the basic results of the survey (less than a year in 2012). In addition, over 50 experienced researchers and experts in the field of health surveys, epidemiology, and migrant health and wellbeing, as well as experts on specific health topics, from THL and other Finnish expert organizations, took part in expert groups in planning and preparing as well as reporting the results of the survey. This broad group of experts, taking part on the basis of their own work, enabled to take into account various aspects of health, wellbeing, migration, and survey methodology.

Throughout the fieldwork period, each of the three target groups (Russian, Somali, and Kurdish) had a fieldwork team of one coordinator coordinating the team and recruiting the participants, one research nurse mainly conducting the health examinations, three to five interviewers conducting the interviews and home visits to recruit the participants, and several interns assisting the team members. All members in fieldwork teams took part in the participant recruitment by contacting the sampled persons and informing about the survey. The research nurses were health care professionals, but there were no specific professional requirements for the coordinators, interviewers or the interns. All the fieldwork personnel of the three teams, except for one intern, were bilingual, to improve ethical conduct and data quality. The main criterion for the interviewers and research nurses was good command of Russian, Somali, or the Sorani dialect of Kurdish language and Finnish. Most of the recruited personnel had no previous experience in survey fieldwork. Some gender matching between the participant and the interviewer was done, when possible, in the Somali and Kurdish groups. The interviewers received full-time training for two weeks before the pilot phase of the fieldwork. Research nurses participated in most of the training sessions of the interviewers and spent additional week training for standardized physical measurements. There was some turnover in the personnel during the fieldwork period as not all team members could work in different cities or they found the tasks too demanding or not suiting their expectations or skills.

Supervising the fieldwork teams was time consuming for the other project organization. Therefore, during the fieldwork period an additional experienced part-time research nurse was recruited to supervise the health examinations and support the fieldwork teams. There was also a physician, expert in questions of migrants' health, available for consultation of the fieldwork personnel throughout the fieldwork period. The physician also reviewed the results of all the laboratory analyses, and when necessary, gave personal feedback to the participants and referred them to the local health centre. Clinical supervision was provided with 1–4 weeks intervals for all the three fieldwork teams in the beginning of the fieldwork period, separately in Russian, Somali, and Kurdish language.

### *Planning and piloting phase*

In the planning stage, in addition of having a large expert group planning the methodology of the survey, focus group discussions and personal interviews with health care professionals (physicians and nurses) with foreign background were organized to address cultural sensitivity and assure cultural acceptance of the survey.

All study materials, for example information leaflets, consent forms and questionnaires were translated into the three languages (Russian, Somali and the Sorani dialect of Kurdish) by professional translators. Before the pilot phase of the fieldwork, the bilingual fieldwork personnel reviewed the translations, and some changes were made to specific concepts, e.g. medical terms in questions concerning diseases.

A pilot study with a random sample of 150 persons (50 persons from each target group) was carried out before the actual fieldwork, with a 43% response rate. A few voluntary participants were also invited to have more possibilities to test the questionnaires. Based on the pilot experiences, the interview was edited to be shorter, an option for a short interview was developed for those refusing to participate in the full interview, and the texts in the invitation letter and consent forms were simplified.

Recruitment protocols were improved, for example by seeking phone numbers both for the sampled person and his/her household members, using two national telephone number services instead of one, and checking regularly for updated address information from the National Population Registry. Furthermore, fieldwork personnel received further training and supervision, and the visibility of the project was increased, including social media, the migrants' own radio channels, TV, and newspapers. In order to build trust and raise interest in the survey among the target communities, the fieldwork personnel contacted non-governmental migrant organizations and visited mosques and other places visited frequently by migrants to disseminate information about the study.

### *Health and wellbeing measures and ethical approval*

The protocols, measurements and instruments of the Maamu Study were chosen and developed to ensure comparability with the general population survey Health 2011. In addition, migration specific topics, for example experiences of discrimination in Finland, traumatic events in the former home country, and female genital mutilation/cutting (FGM/C) were included. Overview of the interview and health examination measurements is provided in Table 1.

The initial plan was to have two separate sessions for each participant: the interview carried out at the participant's home and the health examination at the health examination site (e.g. local health center or hospital outpatient clinic). However, most participants (67%) preferred the two parts to be carried out in a single session in the health examination site. Only 13% of the interviews were carried out at the participants' homes, 7% at THL (this option was available for those living in the metropolitan area), 9% in public places (e.g. library, coffee shop), and 4% in other places (e.g. administered by phone or at friend's house). Originally only computer-assisted personal interviews (CAPI) were to be used. Due to technical difficulties in using different language versions (with three different alphabets) and due to some interviewers having severe difficulties in using the computers, use of paper-based interviews was also necessary.

The total length of one interview was approx. 1–1.5 hours. The length of the interview and the number of questions asked depended on answers to primary questions, for example if the person replied to be unemployed, secondary questions concerning work life were not asked. The short interview included selected key questions both from the full interview and the health examination. The questionnaire was filled out by the fieldwork personnel during the face-to-face or telephone contact, or by the respondent (questionnaire mailed by post or e-mail).

**Table 1**. *Overview of the interview and health examination measures and the number of questions in the full and short interview.*

| Interviewed items (in the interview or health examination): | Full | Short |
|---|---|---|
| Socio-demographic and household characteristics (Heistaro 2008), migration history and integration | 41 | 16 |
| Health status, illnesses, and symptoms (Heistaro 2008) | 41 | 10 |
| Experiences of traumatic events, discrimination, and violence, trauma symptoms | 57 | 5 |
| Health services utilization and experiences (Heistaro 2008) | 28 | 5 |
| Oral health status and use of oral health services (Heistaro 2008) | 9 | 2 |
| Health behaviour (Heistaro 2008; Saunders et al. 1993) | 33 | 6 |
| Social wellbeing (Heistaro 2008) and quality of life (Power 2003; Schmidt, Muhlan and Power 2006) | 42 | 2 |
| Working life (Heistaro 2008; Kiianmaa 2012; Lehto and Sutela 2008; Perkiö-Mäkelä et al. 2010) | 102 | 10 |
| Physical functional capacity (Sainio et al. 2008)* | 6 | 1 |
| Symptoms of allergy, fever and cough, pain (Reunanen and Heliovaara 2008)* | 17 | - |
| HIV awareness and tests (UNAIDS 2009)* | 8 | - |
| Depressive and anxiety symptoms (Derogatis et al. 1974)** | 25 | 3 |
| Psychosomatic symptoms (Lipman, Covi and Shapiro 1979)** | 11 | - |

| Health examination items: |
|---|
| Blood pressure and pulse rate, 3 measurements with automatic device (Omron iC-10; Tolonen and Koponen 2013) |
| Anthropometric measurements: height, weight (beam balance scale), waist and hip circumference (Mäki-Opas, Koponen and Tolonen 2013a; 2013b; 2013c) |
| Physical functional capacity, measurements: standing balance (timed), chair stand (standard chair), and grip strength (Smedley device, 2 measurements/3 if needed; Tolonen et al. 2008) |
| Haemoglobin, fingertip sample (HemoCue Hb 201) |
| Oral examination: dentures, number of teeth (Vehkalahti et al. 2008) |
| Blood samples/assays for chronic disease risk factors (6 tubes, total 36ml): glucose, glycated haemoglobin, total and HDL cholesterol, triglyserides, glutamyltransferace (GT), aspartate amino transferase (ASAT), alanine amino transferase (ALAT), vitamin D (S-25(OH)D), infections (antibodies) with specific/separate consent (HIV, syphilis, Hepatitis B and C), and samples stored for future analysis (-70°C) |

* administered by the research nurse (interviewed) during the health examinations, other interviewed items administered in face-to-face interviews by the interviewers

** self-administered (administered by the research nurse in case of illiteracy) during the health examinations, other interviewed items administered in face-to-face interviews by the interviewers

All clinical measurements of the health examination were carried out according to European health examination survey standards (Tolonen et al. 2008; Tolonen and Koponen 2013). Health examination took approx. 45–60 minutes. Private rooms were available at local primary health care units or hospitals. Nearly all (95–97%) participants agreed to all measurements, including collection of blood samples. A few persons refused some single measurements, mainly of functional ability since not finding them sensible, or were not able to perform them due to pregnancy or disability. Validated translations (Bean et al. 2007) of the Hopkins Symptoms Checklist-25 (HSCL-25) were included in the health examination, filled in self-administered, or upon necessity interviewed (e.g. if the participant was illiterate or had difficulties in seeing).

Most of the interviews and health examinations (91%) were carried out one-on-one between the interviewer or research nurse and the participant. The participant's spouse, children or other persons such as friends and other relatives were present more often in the Somali and Kurdish groups compared to the Russian group. Proxy interviews were rare (1%), and they were conducted when the participant was disabled.

Topics considered in advance particularly sensitive were received mostly without problems by the participants. For example the acceptance of the HIV test was among the highest reported in previous studies among foreign-born populations and the results imply that a universal HIV testing strategy can be well accepted and the test can be included in population-based studies (Tiittala et al. 2015). The acceptance can be facilitated by offering pre-test counselling and correcting any misconceptions regarding the treatment possibilities, normalizing the testing procedure and underlying confidentiality. Another example of a particularly sensitive topic is FGM/C, of which the results of the Maamu Study indicate to be more common among foreign-born women living in Finland than previously assumed (Koukkula et al. 2016). Violent traumatic experiences in the former home country were also mostly feasible to ask (Castaneda et al. 2017), however, for instance the item of experienced sexual violence was too uncomfortable to be reliably asked especially by some of the male interviewers. In addition, modifications to the interview protocol had to be made so that the male interviewers in the Somali and Kurdish fieldwork teams did not ask the questions of reproductive health from the female participants, but instead those were asked by the research nurse along with the health examination. Thus, it seemed to be feasible to include also sensitive questions within the topics investigated, but recommended to be asked by health care professionals.

Ethical approval was obtained from the Coordinating Ethical Committee of the Hospital District of Helsinki and Uusimaa. A written informed consent was obtained separately for the interview and the health examination, to be able to conduct them on separate days. In the informed consent form concerning the health examination, the ethical committee advised in addition to use separate statements of consent for the use of health examination measurement data, for the use of blood samples, and for using the data for other research purposes in the future. There was also a specific consent for the HIV tests. The consent informed also of register linkages and the topic was verbally

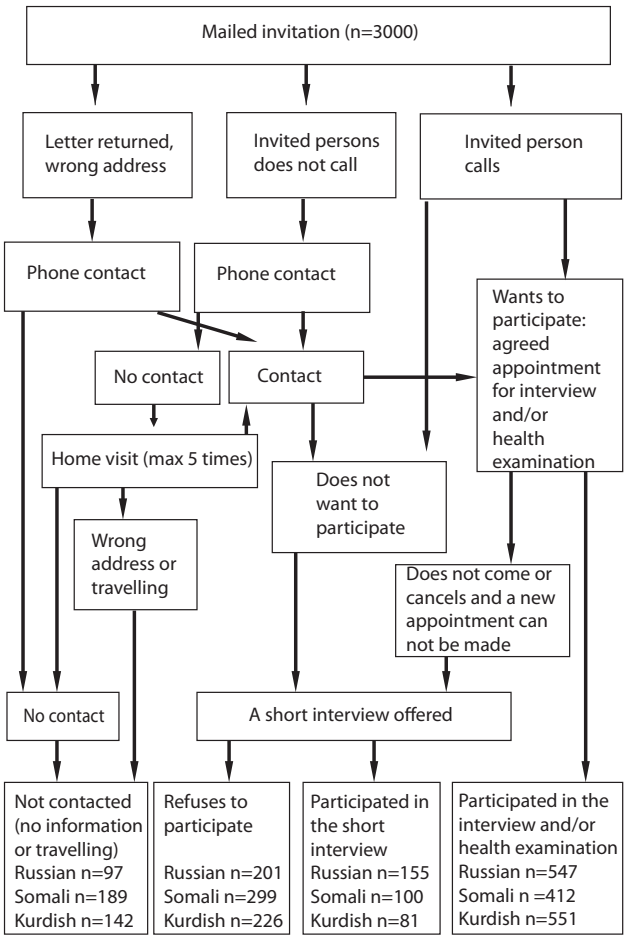


**Figure 1**. *Study flow*

informed before signing the form, but there was no specific consent statement for the use of register data. Having many distinct consents warranted much time and effort to make them clear for the participants.

## *Study flow, recruitment of sampled individuals, response and motivation strategies*

The study flow is illustrated in Figure 1. An invitation letter both in Finnish and Russian/Somali/Kurdish was mailed to all the sampled persons, using addresses obtained from the National Population Registry. The letter included a short description of the study rationale and asked the person to contact the team coordinator, using a toll free telephone number. If the person did not respond to the mailed invitation, the coordinator attempted a telephone contact using numbers obtained from the national telephone number services. If the person was not reached by telephone (i.e. did not have a registered telephone number, the telephone number was not valid or the phone call was not answered), a home visit was made. If only another household member was reached in a

home visit, the telephone number of the sampled person was requested or a request was given to call back. If needed, home visits were repeated up to five times on different days (including weekends) and varying times of day, before the sampled person was categorised as "not reached". Home visits also provided information whether the sampled person had moved or was abroad. If the post returned the invitation due to incorrect address and no telephone number was available, the sampled person was categorized as "not reached".

When the sampled person was reached personally, either by telephone or face-to-face, the fieldwork personnel provided information about the study and in case of consent, booked an appointment for the interview and health examination. Some persons wished to participate only in the interview (3–8%) or only in the health examination (0.1–2%; Table 2). If the sampled person refused to participate in the interview, they were asked to take part in the short interview. The short interview was a necessary compromise in the data collection for example in cases when a person wished to participate but did not have the time for the full interview. However, at some points the option of a short interview might have been offered to a participant too easily instead of the full one, ending up with lower response rate with the items included only in the full interview.

When comparing participation rates in at least one part of the study, Russian origin persons had a similar response rate as the general Finnish population (70% and 71%, respectively), whereas the response rate of Kurdish and Somali origin persons was lower (63% and 51 %, respectively), despite a significantly higher effort that was put

**Table 2.** *Participation to different data collection modes of the Maamu Study.*

| | Russian | | Somali | | Kurdish | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| **Participated in some part of the study** | **702** | **70.2** | **512** | **51.2** | **632** | **63.2** |
| Interview and health examination | 466 | 46.6 | 317 | 31.7 | 480 | 48.0 |
| Only interview | 79 | 7.9 | 34 | 3.4 | 28 | 2.8 |
| Short interview and health examination | 1 | 0.1 | 42 | 4.2 | 26 | 2.6 |
| Only health examination | 1 | 0.1 | 19 | 1.9 | 17 | 1.7 |
| Only short interview | 155 | 15.5 | 100 | 10.0 | 81 | 8.1 |
| **Refused** | **201** | **20.1** | **299** | **29.9** | **226** | **22.6** |
| **Not reached** | **84** | **8.4** | **144** | **14.4** | **134** | **13.4** |
| Wrong address | 22 | 2.2 | 38 | 3.8 | 54 | 5.4 |
| Not reached with home visits | 62 | 6.2 | 106 | 10.6 | 80 | 8.0 |
| **Moved or abroad** | **13** | **1.3** | **45** | **4.5** | **8** | **0.8** |
| **Total** | **1 000** | **100** | **1 000** | **100** | **1 000** | **100** |

into reaching the sampled participants in the Maamu Study compared with the Health 2011 study. In the Health 2011 study, telephone contacts were made only to those who did not arrive to the pre-scheduled health examination appointment provided in the mailed invitation letter. Those who were not reached by telephone were mailed a questionnaire and no home visit attempts were made. The pre-scheduled appointments provided in the invitation letter were tested also in the Maamu Study, but did not show up as a good practice in the foreign-born sample.

Participation rates for the full data collection (full interview and health examination) were 48% for the Kurdish, 47% for the Russian, and 32% for the Somali group (Table 2). The participation rate was higher among women than men in the health examination in the Somali group and in the health examination and short interview in the Kurdish group (Table 3). The participation rate in the interview and health examination was lowest in the youngest age group of Somali origin women and Kurdish origin men and women. No other differences were observed between men and women or age groups in participation into interview, health examination or short interview in the three groups.

The persons were categorized as "refused" if there was a personal contact but a refusal to participate in any mode of the data collection, if they first wanted to consider participation but future contacts were not successful, or if they cancelled the appointment or did not show up and future contacts were not successful. The reasons for non-participation were recorded if the sampled persons indicated why they did not want to

**Table 3**. *Participation by gender and age.*

| | **Russian** | | | | | **Somali** | | | | | **Kurdish** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Men** | | **Women** | | | **Men** | | **Women** | | | **Men** | | **Women** | | |
| | N | % | N | % | p[1] | N | % | N | % | p[1] | N | % | N | % | p[1] |
| **Interview** | | | | | | | | | | | | | | | |
| Age 18–29 | 61 | 47.3 | 84 | 52.8 | | 69 | 35.0 | 5 | 33.5 | | 98 | 38.6 | 67 | 41.9 | |
| Age 30–44 | 70 | 58.3 | 112 | 55.7 | | 55 | 30.1 | 71 | 35.3 | | 116 | 57.4 | 110 | 64.0 | |
| Age 45–64 | 64 | 49.6 | 154 | 58.8 | | 31 | 34.8 | 50 | 47.2 | | 64 | 54.2 | 53 | 56.4 | |
| All | 195 | 51.6 | 350 | 56.3 | 0.149 | 155 | 33.1 | 196 | 36.9 | 0.202 | 278 | 48.4 | 230 | 54.0 | 0.082 |
| p[2] | | 0.187 | | 0.482 | | | 0.544 | | **0.046** | | | **<0.001** | | **<0.001** | |
| **Health examination** | | | | | | | | | | | | | | | |
| Age 18–29 | 49 | 38.0 | 75 | 47.2 | | 70 | 35.5 | 79 | 35.3 | | 96 | 37.8 | 71 | 44.4 | |
| Age 30–44 | 63 | 52.5 | 90 | 44.8 | | 56 | 30.6 | 88 | 43.8 | | 116 | 57.4 | 114 | 66.3 | |
| Age 45–64 | 56 | 43.4 | 135 | 51.5 | | 29 | 32.6 | 56 | 52.8 | | 69 | 58.5 | 54 | 57.5 | |
| All | 168 | 44.4 | 300 | 48.2 | 0.245 | 155 | 33.1 | 223 | 42.0 | **0.004** | 281 | 49.0 | 239 | 56.1 | **0.025** |
| p[2] | | 0.068 | | 0.338 | | | 0.591 | | **0.009** | | | **<0.001** | | **<0.001** | |
| **Short interview** | | | | | | | | | | | | | | | |
| Age 18–29 | 20 | 15.5 | 20 | 12.6 | | 30 | 15.2 | 29 | 13.0 | | 26 | 10.2 | 25 | 15.6 | |
| Age 30–44 | 18 | 15.0 | 39 | 19.4 | | 22 | 12.0 | 32 | 15.9 | | 15 | 7.4 | 19 | 11.1 | |
| Age 45–64 | 24 | 18.6 | 35 | 13.4 | | 12 | 13.5 | 17 | 16.0 | | 7 | 5.9 | 15 | 16.0 | |
| All | 62 | 16.4 | 94 | 15.1 | 0.586 | 64 | 13.7 | 78 | 14.7 | 0.637 | 48 | 8.4 | 59 | 13.9 | **0.006** |
| p[2] | | 0.703 | | 0.116 | | | 0.660 | | 0.625 | | | 0.316 | | 0.386 | |

[1] Difference between genders (p-value) [2] Difference between age groups (p-value)

participate, but gathering the reasons for refusal was not systematic. The most common reasons for non-participation seemed to be being too busy or in principle not willing to take part in any studies. While getting new information on one's own health seemed to motivate participation for most persons, one common reason for non-participation was not seeing any personal benefit from the survey.

The participants received information and advice from the clinical measurements, but no other incentives were given. In addition, a lottery was held among the participants in every city to motivate participation. Prizes included gift tokens to local sports and cultural activities. Travel expenses to the examination site were reimbursed for those who reported they were unable to cover these themselves.

### *Characteristics of the participation and non-participation*

Predictors of non-response were estimated using a logistic regression model, where the outcome variable was participation status. The set of potential predictors consisted of migrant group, age group, gender, city, and marital status. The best fitting model was chosen using Bayesian Information Criterion (BIC, Schwarz 1978), and it included all main effects of the covariates. Interactions between variables did not improve the predicting power of the model. The model was then applied to Inverse Probability Weighting (IPW, Robins, Rotnitzky and Zhao 1994), which is commonly utilized in correcting the effects of non-response. The IPW weights were further calibrated with respect to the population sizes of the strata in order to obtain representative aggregated results across the cities.

Age-adjusted differences between the four groups were tested using linear and logistic regression models, and the Satterthwaite adjusted F-test using SUDAAN software package (Research Triangle Institute 2012). Also the differences between crude values of the participants and non-participants were tested. The mean age of the participants (crude values) varied from 35 to 40 years in the Maamu sample and was 42 years in the general population sample (Table 4). Participants were older than non-participants in all of the four groups. There were more female than male participants in the Russian, Somali and general population groups, but not in the Kurdish group, and there were more women in the participants than non-participants in the Somali, Kurdish and general population groups. Also in Somali, Kurdish and general population groups there were more married individuals in participants than non-participants. Among Somali and Kurdish participants 68% were married whereas the respective figure was 53% among the Russian and 42% among the general population participants. In the Somali group there was greater loss of participants in the metropolitan area than outside of it. Educational level was lowest among Somali and Kurdish participants and highest among the Russians. Of the general population 72% were employed, while the corresponding figures for the Russian, Somali and Kurdish origin persons were 52%, 23% and 39%, respectively. Of the Somali and Kurdish origin persons 74–76% had entered the country with a refugee or asylum seeker status. Somali origin persons had lived in

**Table 4.** *Characteristics of the study participants and non-participants.*

| | Russian | Somali | Kurdish | General population | p[1] |
|---|---|---|---|---|---|
| **Age (mean)** | | | | | |
| Participants (weighted) | 39.3 | 38.7 | 38.8 | 40.1 | **<0.001** |
| Participants (crude) | 40.2 | 35.1 | 35.4 | 42.3 | |
| Non-participants (crude) | 37.8 | 33.5 | 32.3 | 35.7 | |
| p[2] | **0.012** | **0.035** | **<0.001** | **<0.001** | |
| **Male (%)** | | | | | |
| Participants (weighted)[3] | 34.9 | 42.6 | 53.9 | 43.2 | **<0.001** |
| Participants (crude) | 34.9 | 42.8 | 54.0 | 43.1 | |
| Non-participants (crude) | 38.3 | 50.3 | 63.1 | 58.1 | |
| p[2] | 0.341 | **0.025** | **0.006** | **<0.001** | |
| **Married or registered partnership (%)** | | | | | |
| Participants (weighted)[3] | 52.5 | 67.7 | 68.0 | 42.3 | **<0.001** |
| Participants (crude) | 53.5 | 63.4 | 64.6 | 44.6 | |
| Non-participants (crude) | 46.7 | 53.7 | 45.8 | 24.3 | |
| p[2] | 0.073 | **0.003** | **<0.001** | **<0.001** | |
| **Municipality/region: metropolitan area (%)** | | | | | |
| Participants (weighted)[3] | 79.0 | 79.5 | 53.6 | 69.5 | **<0.001** |
| Participants (crude) | 79.1 | 78.8 | 53.0 | 69.9 | |
| Non-participants (crude) | 79.9 | 92.5 | 54.8 | 71.2 | |
| p[2] | 0.775 | **<0.001** | 0.594 | 0.508 | |
| **Basic education[4]** | | | | | |
| High school level (or at least part of it)[3] | 77.7 | 25.6 | 41.4 | 63.5 | **<0.001** |
| **Employment status[4]** | | | | | |
| Employed[3] | 52.2 | 22.6 | 39.2 | 71.6 | **<0.001** |
| **Migrant background characteristics[4]** | | | | | |
| Migration status: refugee (%)[3] | 0.9 | 73.5 | 76.0 | | **<0.001** |
| Time lived in Finland (mean)[3] | 11.8 | 12.3 | 11.1 | | **0.005** |
| Age when moving to Finland (mean)[3] | 25.2 | 23.9 | 25.2 | | **0.004** |
| Finnish nationality (%)[3] | 46.9 | 44.0 | 47.5 | | 0.529 |

[1] Difference between the ethnic groups (p-value)

[2] Difference between participants (crude) and non-participants (crude; p-value)

[3] Age-adjusted values

[4] Self-reported in the interview (other figures are based on register data)

Finland for the longest time and moved to the country in youngest age. 7% of the Somali origin persons and 6% of the Kurdish origin persons were illiterate. 44% of the Somali origin persons, 47% of the Russian origin persons and 48% of the Kurdish origin persons had Finnish nationality.

### *Data utilization and stakeholder relevance*

The aim of the Maamu Study was to obtain information about health and wellbeing of the foreign-born population in Finland, and to promote the use of study results in developing health and welfare services at the national level. The preliminary results were first discussed with the fieldwork personnel, and workshops for the personnel and managers of the local health and welfare services in each six cities were organized within 1–2 months after the fieldwork period had ended in the particular city. In these workshops the first preliminary results were presented, followed by a discussion on the relevance and interpretation of the results. The basic results were published in a research report (Castaneda et al. 2012) in the end of the externally funded project period and discussed at a national seminar with representatives of the funding and collaborating organizations, ministries and non-governmental organizations as well as professionals and decision makers from the municipalities.

Raising awareness on health and welfare within the three ethnic communities was also aimed at, and three workshops were organized where the preliminary results were presented in the groups' own languages by the bilingual fieldwork personnel or via an interpreter. An invitation to these open "target group workshops" were sent to all of the study participants and disseminated in the communities. Even though participation to these workshops was not very high, the discussions were lively. All participants also received a mailed summary of the study results in Finnish and in their native language. These actions, in addition to raising awareness on health, hopefully promote willingness to participate in future surveys, as many participants claimed that they had not seen the results of previous studies they had attended to, and they had not been able to identify how the study results had been used. This may be due to the fact that almost all previous studies among foreign origin persons in Finland have been carried out by master's or doctoral students, with small local samples and not too wide general implementation of the results.

Register linkages were made using the personal identification code assigned to all residents in Finland. Administrative register data (Table 5) was obtained with specific permissions from each register owner. Register data is used to analyze non-response and to obtain additional information on sociodemographic characteristics and use of health services and social security benefits. Register-based data will also be used to examine whether the use of social security and health services is adequately related to the needs identified in the survey data.

The data of the Maamu Study have been widely used in academic research and the results have shown for example that mental health symptoms are alarmingly high par-

**Table 5**. *Register data available for the Maamu and the Health 2011 samples.*

| Organization | Data |
|---|---|
| Population Register Centre (sample) | • Age, gender, country and date of birth, mother tongue, nationality, place and type of residence, marital status, number of persons in the household |
| Ministry of Employment and the Economy | • Employment service register data: periods of unemployment, participation in labour market training, work/training trials |
| The Social Insurance Institution (Kela) | • Coverage by the social insurance in Finland<br>• Disability, rehabilitation and sickness allowances<br>• Reimbursement for medicine expenses<br>• Purchases of selected medicines<br>• Unemployment allowances<br>• Maternity and family benefits<br>• Housing benefits<br>• Allowances for students<br>• Allowances for pensioners |
| National Institute for Health and Welfare (THL) | • Care Register for Health Care (inpatient care and outpatient visits, diagnoses and operations and other care procedures)<br>• Register of Primary Health Care Visits<br>• Cancer registry (diagnosed cancers)<br>• Cancer screening registry (mammography and pap smear)<br>• Medical Birth Register (year(s) of giving birth, prenatal care and care during births)<br>• Register of Induced Abortions (year(s) of procedures)<br>• National Infectious Diseases Register (selected diagnosed diseases)<br>• Register of Social Assistance (household receiving social assistance) |
| Statistics Finland | • Education, occupation and socioeconomic status |

ticularly among Kurdish origin persons (Rask et al. 2016b) and mobility limitations among Somali and Kurdish origin adults (Rask et al. 2016a). Experiences of discrimination have been shown to be common and to increase the odds for poorer health and wellbeing (Castaneda et al. 2015; Rask et al. 2018). As another example, significant variations in cardiovascular risk profiles among Kurdish and Somali origin persons compared to the general population have also been observed (Skogberg et al. 2016). These findings and the many others already published or forthcoming have been taken into account in planning and implementing health promotion strategies, for example by a large national level development project called PALOMA that develops mental health services for refugees (Castaneda et al. 2018), and need to be taken into account in the future, too. The Maamu data is available for researchers free of charge upon a research plan, and researchers interested in accessing the data are encouraged to contact the corresponding author of the article.

## Discussion

Bhopal (2014) suggests that the ideal population study would be inclusive of all minority groups, have uniformly high response rates, provide data that are comparable across all groups, collect information on all relevant faces of migration status, include data on all potential confounding variables, and be interpreted in a way that advances science, improves health status, and develops better health care. The Maamu Study meets most of these criteria. It includes not all but three major foreign-born groups in Finland and a wide variety of confounding and health variables. Several strategies were applied in all stages of the survey process to enhance interaction with the communities and enable participation. The rate of participation was relatively high and successfully improved after the pilot phase of the fieldwork. All measurements, also the sensitive ones, were well accepted by the participants.

The main limitations to data comparability of this study are related to the challenge of balancing between the needs to use standardized methods and instruments, and the need for special linguistic or cultural solutions and adaptations for the data collection, as previously discussed, too (Yancey, Ortega and Kumanyika 2006). The data comparability across all groups in the Maamu Study may also be limited since there were not enough resources for an optimal translation process with back-translations or conceptual translations. Previously validated translations with the three languages used in this study were available only for the HSCL instrument (Bean et al. 2007; Derogatis et al. 1974). The survey questions were mainly those that had been used in Finnish surveys to assure the availability of a reference group and the comparability of the results of the Maamu study to the results of the general population, to address the ethnic gaps in health and wellbeing. It was time consuming to check the translations with the bilingual fieldwork staff members, but this proved to be feasible and it most likely improved the validity. Our experience supports the need to apply team or committee approaches to translation

processes with several stages (Erens 2013) instead of a simple back-translation process. All fieldwork team members in our survey did not have adequate knowledge on specific concepts, and these needed to be repeatedly explained via training prior to data collection and via supervision during the fieldwork period, so that the interviewers could give additional instructions to the participants when needed during the interviews for the questions be understood correctly. Due to these difficulties, some items of the interview were not usable. Thus, the study would have benefitted of a more experienced fieldwork personnel.

The interviewer effects on the reponses to sensitive information is also an important topic. The face to face interview is a very sensitive situation especially when health survey questions normally include also very intimate, delicate or moral aspects. Interviewers can have a major effect on various measures of survey data quality, including unit response rates, item missing rates, estimates of uncertainty (variances), and the accuracy of survey estimates (Davis et al. 2010). Thus, the interviewer effects are important to be noted and evaluated.

All clinical measurements during the health examination were carried out according to the European standards (Tolonen et al. 2008; Tolonen and Koponen 2013). However, cultural aspects may have affected the performance of both the nurses and the participants. Supervision and quality control during the fieldwork was done and aimed to reduce this kind of bias, but at the same time culturally acceptability of the protocols needed to be secured by allowing flexibility in some of the measures. For example, anthropometric measurements were carried out wearing light clothing rather than strictly following the recommendation to measure over bare skin, if undressing was uncomfortable for the participants.

The main challenges of the present study included, in particular, training and guidance or supervision of the fieldwork personnel, and reaching the sampled persons. Carling, Erdal and Ezzati (2014) have pointed out the complexity of the insider-outsider divide in migration research. They argue that when ethno-national origin is shared, differences in for instance class, education or migration history can be accentuated. Insiders who have foreign origin background can facilitate access and interaction with their linguistic and cultural skills, while outsiders can encourage participants to reveal things that are taken for granted within the group. The experiences of the Maamu Study show that there are benefits in having both insiders and outsiders in the survey personnel. However, while ethnic matching may help to increase response rates and positively affect responses given on some topics, such as racism, it may negatively affect some other topics, such as culturally taboo behaviours, as also pointed out by Erens (2013) and van Heelsum (2013). Using of the participants' native language was an advantage, but a common language and cultural background shared by the participant and the interviewer or research nurse may also have hampered the data collection to some extent. Reporting sensitive issues amongst members of one's own community can be problematic. This may have led to under- or over-reporting in the sensitive questions even though confidentiality, data protection protocols and the role of THL in Finland was

highly stressed in the training of interviewers and research nurses as well as while recruiting participants and obtaining informed consent. Worries about the confidentiality of the interviews and distrust toward research seem to be key barriers in studies among ethnic minority groups (Levkoff and Sanchez 2003; Reiss et al. 2014; van Heelsum 2013), which was seen also in the Maamu Study and stressed the role of building trust with the target communities.

The presence of family members and other persons during some interviews and/or health examinations may also have led to under- or over-reporting. However, their presence also enhanced acceptance and improved possibilities for participation, recognizing the role of family members in the decision to participate (Levkoff and Sanchez 2003).

In addition to translation of questionnaires and the provision of bilingual interviewers, other cultural adaptations, such as personal contacts, ethnic and gender matching of fieldwork staff and participants, community involvement in advisory groups, and relationships with community leaders or gatekeepers have been reported as potential strategies to improve recruitment among ethnic minorities (Clark 2012; Erens 2013; Levkoff and Sanchez 2003; Reiss et al. 2014; Yancey et al. 2006). The experiences gained in the Maamu Study agree with these observations.

The participation rate varied between the three groups. The rate was the lowest among the Somali origin persons, which may be partly due to the fact that Somalis in Finland have been studied a lot and the community might feel that they are not gaining from participating. In addition, Somalis in Finland are a visible minority and sometimes targeted to negative attitudes, which may lead to unwillingness to participate.

## Conclusions

The engagement of the target groups in all stages of the survey process and adaptations made to improve cultural acceptance of the study proved to be successful. The results based on the survey data have been valuable in pointing out major health problems and significant differences between the studied ethnic minority groups and the general population. Future studies need to solve the challenges in balancing the need for data comparability and standardization with the need for enhancing participation and data validity through necessary cultural adaptations. Documentation of the experiences, challenges and resolutions, from conducting migrant surveys is essential. For instance, experiences of the Maamu Study have gained other Finnish migrant surveys later on, like the Survey on work and well-being among persons of foreign origin (UTH-survey; Nieminen et al. 2015). A handbook (Statistics Finland 2015) was also written based on the experiences of the two surveys (available in Finnish only).

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## References

Bean, T., Derluyn, I., Eurelings-Bontekoe, E., Broekaert, E., & Spinhoven, P. (2007). Validation of the multiple language versions of the Hopkins Symptom Checklist-37 for refugee adolescents. *Adolescence* 42(165), 51–71.

Bhopal, R. (2014). *Migration, Ethnicity, Race, and Health in Multicultural Societies*. Oxford: Oxford University Press.

Borodulin, K., Vartiainen, E., Juolevi, A., Männistö, S., Salomaa, V., Sundvall, J., & Puska, P. (2015). Forty-year trends in cardiovascular risk factors in Finland. *European Journal of Public Health* 25(3), 539–46.

Carling, J., Erdal, M. B., & Ezzati, R. T. (2013). Beyond the insider-outsider divide in migration research. *Migration Studies* 2(1), 36–54.

Castaneda, A. E., Rask, S., Koponen, P., Mölsä, M., & Koskinen, S. (Eds.) (2012). *Maahanmuuttajien terveys ja hyvinvointi. Tutkimus venäläis-, somalialais- ja kurditaustaisista Suomessa [Migrant Health and Wellbeing. A study on persons of Russian, Somali and Kurdish origin in Finland]*. Report 2012, No. 61. Helsinki: National Institute for Health and Welfare.

Castaneda, A. E., Rask, S., Koponen, P., Suvisaari, J., Koskinen, S., Härkänen, T., Mannila, S., Laitinen, K., Jukarainen, P., & Jasinskaja-Lahti, I. (2015). The association between discrimination and psychological and social well-being: a population-based study of Russian, Somali and Kurdish migrants in Finland. *Psychology and Developing Societies* 27(2), 270–92.

Castaneda, A. E., Junna, L., Lilja, E., Skogberg, N., Kuusio, H., Koponen, P., & Suvisaari, J. (2017). The prevalence of potentially traumatic pre-migration experiences: a population-based study of Russian, Somali and Kurdish origin migrants in Finland. *Journal of Traumatic Stress Disorder and Treatment* 6(1).

Castaneda, A. E., Mäki-Opas, J., Jokela, S., Kivi, N., Lähteenmäki, M., Miettinen, T., Nieminen, S., Santalahti, P. (2018). *Pakolaisten mielenterveyden tukeminen Suomessa*. Publications of the National Institute for Health and Welfare. Helsinki.

Clark, M. J. (2012). Cross-cultural research: challenge and competence. *International Journal of Nursing Practice* 18(2), 28–37.

Davis, R. E., Couper, M. P., Janz, N. K., Caldwell, C. H. & Resnicow, K. (2010). Interviewer effects in public health surveys. *Health Education Research* 25(1), 14–26.

Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., & Covi, L. (1974). The Hopkins Symptom Checklist (HSCL): a self-report symptom inventory. *Behavioral Science* 19(1), 1–15.

Dinesen, C., Nielsen, S. S., Mortensen, L. H., & Krasnik, A. (2011). Inequality in self-rated health among immigrants, their descendants and ethnic Danes: examining the role of socioeconomic position. *International Journal of Public Health* 56(5), 503–14.

Erens, B. (2013). Designing high-quality surveys of ethnic minority groups in the United Kingdom. In Font, J. and Mendez, M. (Eds.) *Surveying Ethnic Minorities and Immigrant Populations*, pp. 45–67. Amsterdam: Amsterdam University Press.

Haukka, E., Kaila-Kangas, L., Ojajarvi, A., Miranda, H., Karppinen, J., Viikari-Juntura, E., Heliovaara, M., & Leino-Arjas, P. (2013). Pain in multiple sites and sickness absence trajectories: a prospective study among Finns. *Pain* 154(2), 306–12.

Heistaro, S. (Ed.) (2008). *Methodology Report. Health 2000 Survey*, Report 2008, No. B26. Helsinki: National Public Health Institute.

Kiianmaa, N. (2012). *Tasa-arvobarometri 2012 [The Gender Equality Barometer 2012]*. Report 2012, No. 23. Helsinki: Ministry of Social Affairs and Health.

Kirmayer, L. J., Narasiah, L., Munoz, M., Rashid, M., Ryder, A. G., Guzder, J., Hassan, G., Rousseau, C., Pottie, K., & Canadian Collaboration for Immigrant and Refugee Health (CCIRH) (2011). Common mental health problems in immigrants and refugees: general approach in primary care. *Canadian Medical Association Journal* 183(12), E959–67.

Koskinen, S., Lundqvist, A., & Ristiluoma, N. (Eds.) (2012). *Terveys, toimintakyky ja hyvinvointi Suomessa vuonna 2011 [Health, functional capacity and welfare in Finland in 2011]*. Report 2012, No. 68. Helsinki: National Institute for Health and Welfare.

Koukkula, M., Keskimäki, I., Koponen, P., Mölsä, M., & Klemetti, R. (2016). Female genital mutilation/cutting among women of Somali and Kurdish origin in Finland. *Birth* 43(3), 240–6.

Lehto, A., & Sutela, H. (2008). *Työolojen kolme vuosikymmentä. Työolotutkimusten tuloksia 1977–2008 [Three decades of working conditions. Results from quality of work life surveys 1977–2008]*. Helsinki: Statistics Finland.

Levkoff, S., & Sanchez, H. (2003). Lessons learned about minority recruitment and retention from the Centers on Minority Aging and Health Promotion. *Gerontologist* 43(1), 18–26.

Lipman, R. S., Covi, L., & Shapiro, A. K. (1979). The Hopkins Symptom Checklist (HSCL) – factors derived from the HSCL-90. *Journal of Affective Disorders* 1(1), 9–24.

Mäki-Opas, J., Koponen, P., & Tolonen, H. (2013a). Height. In Tolonen, H. (Ed.) EHES Manual, Part B. Fieldwork Procedures. Helsinki: National Institute for Health and Welfare.

– (2013b). Waist circumference. In Tolonen, H. (Ed.) *EHES Manual, Part B. Fieldwork Procedures.* Helsinki: National Institute for Health and Welfare.

– (2013c). Weight. In Tolonen, H. (Ed.) *EHES Manual, Part B. Fieldwork Procedures*. Helsinki: National Institute for Health and Welfare.

*Malin, M. & Raisamo, S. (2011). Maahanmuuttajien elinolojen ja terveyden selvittämiseksi on tehtävä erillisiä tutkimuksia. Maahanmuuttajien hyvinvointisurveyt I/II*. Hyvinvointikatsaus 4, 2011.

Malin, M. & Raisamo, S. (2012). *Maahanmuuttajien hyvinvointitutkimuksen kehittäminen auttaa sekä maahanmuuttajia että yhteiskuntaa. Maahanmuuttajien hyvinvointisurveyt II*. Hyvinvointikatsaus 2:67-71, 2012.

Moullan, Y., & Jusot, F. (2014). Why is the 'healthy immigrant effect' different between European countries?. *European Journal of Public Health* 24(1), 80–6.

Nielsen, S. S., & Krasnik, A. (2010). Poorer self-perceived health among migrants and ethnic minorities versus the majority population in Europe: a systematic review. *International Journal of Public Health* 55(5), 357–71.

Nieminen, T., Sutela, H. & Hannula, U. (2015). *Ulkomaista syntyperää olevien työ ja hyvinvointi Suomessa 2014*. Publications of Statistics Finland. Helsinki.

Perkiö-Mäkelä, M., Hirvonen, M., Elo, A.-L., Kandolin, I., Kauppinen, K., Kauppinen, T., Ketola, R., Leino, T., Manninen, P., Miettinen, S., Reijula, K., Salminen, S., Toivanen, M., Tuomivaara, S., Vartiala, M., Venäläinen, S., & Viluksela, S. (Eds.) *Työ ja terveys -haastattelututkimus 2009 [Work and health interview study 2009]*. Helsinki: Finnish Institute of Occupational Health.

Pohjanpää, K., Paananen, S., & Nieminen, M. (2003). *Maahanmuuttajien elinolot – Venäläisten, virolaisten, somalialaisten ja vietnamilaisten elämää Suomessa 2002 [Living conditions of immigrants in Finland – The life of Russians, Estonians, Somalians, and Vietnamese in Finland in 2012]*. Helsinki: Statistics Finland.

Power, M. (2003). Development of a common instrument for quality of life. In Nosikov, A. and Gudex, C. (Eds.) *EUROHIS: Developing a common instrument for health surveys*. Amsterdam: World Health Organization.

Rask, S., Sainio, P., Castaneda, A. E., Härkänen, T., Stenholm, S., Koponen, P., & Koskinen, S. (2016a). The ethnic gap in mobility: a comparison of Russian, Somali and Kurdish origin migrants and the general Finnish population. *BMC Public Health* 16(340).

Rask, S., Suvisaari, J., Koskinen, S., Koponen, P., Mölsä, M., Lehtisalo, R., Schubert, C., Pakaslahti, A., & Castaneda, A. E. (2016b). The ethnic gap in mental health: a population-based study of Russian, Somali and Kurdish origin migrants in Finland. *Scandinavian Journal of Public Health* 44(3), 281–90.

Rask, S., Elo, I. T., Koskinen, S., Lilja, E., Koponen, P., & Castaneda, A. E. (2018). The association between discrimination and health: findings on Russian, Somali and Kurdish origin populations in Finland. *European Journal of Public Health*.

Rechel, B., Mladovsky, P., & Deville, W. (2012). Monitoring migrant health in Europe: a narrative review of data collection practices. *Health Policy* 105(1), 10–6.

Reiss, K., Dragano, N., Ellert, U., Fricke, J., Greiser, K. H., Keil, T., Krist, L., Moebus, S., Pundt, N., Schlaud, M., Yesil-Jürgens, R., Zeeb, H., Zimmermann, H., Razum, O., Jöckel, K. H., & Becher, H. (2014). Comparing sampling strategies to recruit migrants for an epidemiological study. Results from a German feasibility study. *European Journal of Public Health* 24(5), 721–6.

Research Triangle Institute (2012). *SUDAAN Language Manual, Volumes 1 and 2*. Release 2012, No. 11. NC: Research Triangle Institute, Research Triangle Park.

Reunanen, A., & Heliovaara, M. (2008). Symptoms interview. In Heistaro, S. (Ed.) *Methodology Report. Health 2000 Survey*, pp. 56–9, Report, No. B26. Helsinki: National Public Health Institute.

Robins, J., Rotnitzky, A., & Zhao, L. (1994). Estimation of regression coefficients when some regressors are not always observed. *Journal of the American Statistical Association* 89(427), 846–66.

Sainio, P., Koskinen, S., Natunen, S. & functional capacity team (2008). Functional capacity. In Heistaro, S. (Ed.) *Methodology Report. Health 2000 Survey*, pp. 92–104, Report, No. B26. Helsinki: National Public Health Institute.

Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption – II. *Addiction* 88(6), 791–804.

Schmidt, S., Muhlan, H., & Power, M. (2006). The EUROHIS-QOL 8-item index: psychometric results of a cross-cultural field study. *European Journal of Public Health* 16(4), 420–8.

Schwarz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics* 6(2), 461–4.

Skogberg, N., Laatikainen, T., Koskinen, S., Vartiainen, E., Jula, A., Leiviskä, J., Härkänen, T., & Koponen, P. (2016). Cardiovascular risk factors among Russian, Somali and Kurdish migrants in comparison with the general Finnish population. *European Journal of Public Health* 26(4), 667–73.

Statistics Finland (2015). *Maahanmuuttajat väestötutkimuksissa – Hyviä käytäntöjä kvantitatiivisen haastattelututkimuksen tekoon.* Publications of the Statistics Finland. Käsikirja/51. Helsinki.

Statistics Finland (2018). *Väestö kansalaisuuden, syntymämaan, kielen ja syntyperän mukaan 1990–2016 [The population by nationality, country of birth, language and origin in 1990–2016]*. [accessed 21 July 2018]. http://pxnet2.stat.fi/PXWeb/pxweb/fi/Maahanmuuttajat_ja_kotoutuminen/Maahanmuuttajat_ja_kotoutuminen__Maahanmuuttajat_ja_kotoutuminen/005_kaikki.px/?rxid=9838aa7b-c431-417d-abad-938276457e10

Stronks, K., Ravelli, A. C., & Reijneveld, S. A. (2001). Immigrants in the Netherlands: equal access for equal needs? *Journal of Epidemiology and Community Health* 55(10), 701–7.

Tiitala, P., Kivelä, P., Ristola, M., Surcel, H.-M., Koponen, P., Mölsä, M., Ollgren, J., & Liitsola, K. (2015). Achieving high acceptability of HIV testing in a population-based survey among immigrants in Finland. *Scandinavian Journal of Public Health* 43(4), 393–8.

Tolonen, H., Koponen, P., Aromaa, A., Conti, S., Graff-Iversen, S., Grotvedt, L., Heldal, J., Kanieff, M., Mindell, J., Natunen, S., Primatesta, P., Verschuren, M., Viet, L., & Kuulasmaa, K. for the Feasibility of a European Health Examination Survey (FEHES) Project (2008). *Recommendations for the Health Examination Surveys in Europe.* Report 2008, No. B21. Helsinki: National Public Health Institute.

Tolonen, H., & Koponen, P. (2013). Blood pressure. In Tolonen, H. (Ed.) *EHES Manual Part B. Fieldwork Procedures*. Helsinki: National Institute for Health and Welfare.

Toselli, S., Gualdi-Russo, E., Marzouk, D., Sundquist, J., & Sundquist, K. (2014). Psychosocial health among immigrants in central and southern Europe. *European Journal of Public Health* 24(1), 26–30.

Uiters, E., Deville, W., Foets, M., Spreeuwenberg, P., & Groenewegen, P. P. (2009). Differences between immigrant and non-immigrant groups in the use of primary medical care: a systematic review. *BMC Health Services Research* 9(76).

UNAIDS (2009). *Guidelines on construction of core indicators.* [accessed 21 July 2018]. http://data.unaids.org/pub/manual/2009/jc1676_core_indicators_2009_en.pdf.

van Heelsum, A. (2013). The influence of interviewers' ethnic background in a survey among Surinamese in the Netherlands. In Font, J. and Mendez, M. *Surveying Ethnic Minorities and Immigrant Populations*, pp. 111–30. Amsterdam: Amsterdam University Press.

Vasankari, T. M., Impivaara, O., Heliovaara, M., Heistaro, S., Liippo, K., Puukka, P., Saarelainen, S., Kanervisto, M., & Jousilahti, P. (2010). No increase in the prevalence of COPD in two decades. *The European Respiratory Journal* 36(4), 766–73.

Vehkalahti, M., Nordblad, A., Suominen-Taipale, L., Arinen, S., Hallikainen, D., Hausen, H., Knuuttila, M., Söderholm, A., Varsio, S., Soikkonen, K., Könönen, M., & Pietilä, T. (2008). Oral health examination. In Heistaro, S. (Ed.) *Methodology Report. Health 2000 Survey*, pp. 78–91, Report, No. B26. Helsinki: National Public Health Institute.

Yancey, A., Ortega, A., & Kumanyika, S. (2006). Effective recruitment and retention of minority research participants. *Annual Review of Public Health* 27, 1–28.